PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IMG/43619PCT1	**FOR FURTHER ACTION** See Form PCT/IPEA/416	
International application No. PCT/GB2004/001592	International filing date *(day/month/year)* 08.04.2004	Priority date *(day/month/year)* 16.04.2003
International Patent Classification (IPC) or national classification and IPC F24F13/02, F16L9/00		
Applicant VERPLAS LIMITED et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *sent to the applicant and to the International Bureau)* a total of 4 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
16.11.2004	11.07.2005
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Gonzalez-Granda, C Telephone No. +31 70 340-3721

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/001592

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

3-5	as originally filed
1-2	received on 19.11.2004 with letter of 16.11.2004

Claims, Numbers

1-15	received on 19.11.2004 with letter of 16.11.2004

Drawings, Sheets

1/2-2/2	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-15
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	15
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 The following documents are referred to in this communication:
D1 : US 5 285 818 A (HUMMERT III AUGUST H) 15 February 1994 (1994-02-15)
D2 : GB 1 241 413 A (ATOMIC POWER CONSTRUCTIONS LIMITED) 4 August 1971 (1971-08-04)
D3: DATABASE EPODOC EUROPEAN PATENT OFFICE, THE HAGUE, NL; XP002289554 GR1002959

2 INDEPENDENT CLAIM 1

The document D2 is regarded as being the closest prior art to the subject-matter of claim 1 and shows in figures 1,9,10 and in claim 1 (the references in parentheses applying to this document):
A ventilation duct comprising a plurality of elongate panels and integrally formed hinge means (2), each panel being joined to an adjacent panel by said integrally formed hinge means (2) to enable relative movement between the panels so that the duct can be collapsable.

The subject-matter of claim 1 differs from this known D2 in that the ventilation duct is seamless.
The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to provide easy means to erect/collapse a ventilation duct formed from a number of elongate panels, so that it is ready to erect for installation or to fold for transportation or storage.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
The ventilation duct of the invention is completely seamless so that none of the panels have to be joined to adjacent panels to form the erected duct.

Claims 2-11 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3 INDEPENDENT CLAIM 12

Independent claim 12 is considered new and inventive.
in claim 1 the ventilation duct comprises of elongated panels, this differs from the known D2 in that the duct is completely seamless. The method of manufacturing such a seamless ventilation duct that comprises the steps of extruding or moulding should be considered new and inventive.

Claims 13-15 are dependent on claim 12 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Ventilation Duct

Description

The present invention relates to a ventilation duct or tube primarily used in buildings to convey hot or cold air for heating and cooling purposes respectively, and in other circumstances where a circulation of air or fluids is required.

Conventional ducting of tubing is usually assembled prior to delivery to the installation site so that it can be installed quickly without any further assembly. However, this means that the ducting is cumbersome and bulky and so is difficult to transport easily. This results in an increase in costs.

Ventilation ducts are known which are delivered to the installation site as individual panels which are then assembled prior to installation. However, assembly is time consuming and often requires welding equipment or the ducting includes other components to enable the panels to be connected together. Again, the need for additional components increases manufacturing costs.

It is an object of the present invention to overcome or substantially alleviate the disadvantages with conventional ducting such as those mentioned above.

According to the invention, there is provided a seamless ventilation duct comprising a plurality of elongate panels and integrally formed hinge means, each panel being joined to an adjacent panel by the integrally formed hinge means to enable relative movement between said panels so that the duct can be collapsed for transportation and/or storage.

Preferably, the hinge means comprises an elongate channel in the duct between each panel so that the duct folds in the region of the channel to enable relative movement between the panels.

Each panel is preferably disposed substantially at right angles to two adjacent panels when the duct is erected.

In a preferred embodiment, each panel is rigid or semi-rigid and forms one side-wall of the duct.

When the duct is collapsed, each side-wall conveniently lies substantially in contact with another side-wall.

The side-walls preferably define a parallelogram in cross-section. However, it is envisaged that there may be more than four side-walls in which case the side-walls together define a multi-sided profile in cross-section.

The duct is advantageously made from plastics material such as polypropylene or PVC. However, it may also be made from any thermoplastic or thermoplastic elastomer with appropriate physical properties to produce an effective hinge mechanism and the hinge means may be formed from a dissimilar material to the side walls. The duct is preferably extruded. However, it is envisaged that other methods of manufacture such as injection moulding or blow moulding could be employed.

The present invention also provides a method of manufacturing a seamless extruded ventilation duct comprising a plurality of elongate panels and integrally formed hinge means, with each panel being joined to an adjacent panel by said integrally formed hinge means to enable relative movement between the panels, comprising the steps of extruding or moulding the duct, allowing the duct to cool and folding the duct about the hinge means to collapse it for transportation or storage.

The duct may be extruded or moulded in an erect or partially erect condition. However, it may alternatively be extruded in a flat condition and subsequently erected for installation.

Claims

1. A seamless ventilation duct comprising a plurality of elongate panels and integrally formed hinge means, each panel being joined to an adjacent panel by said integrally formed hinge means to enable relative movement between the panels so that the duct can be collapsed for transportation and/or storage.

2. A seamless ventilation duct according to claim 1 wherein said hinge means comprises an elongate channel in the duct between each panel so that the duct folds in the region of the channel to enable relative movement between the panels.

3. A seamless ventilation duct according to claim 1 or 2 wherein each panel is disposed substantially at right angles to two adjacent panels when the duct is erected.

4. A seamless ventilation duct according to claim 3 wherein each panel is rigid or semi-rigid and forms one side-wall of the duct.

5. A seamless ventilation duct according to claim 4 wherein each side wall lies substantially in contact with another side-wall when the duct is collapsed.

6. A seamless ventilation duct according to claim 4 or 5 wherein the side walls define a parallelogram or other multi-sided profile in cross-section.

7. A seamless ventilation duct according to any preceding claim, wherein the hinge means are formed from a dissimilar material to the side walls.

8. A seamless ventilation duct according to any preceding claim, wherein the duct is made from plastics material.

9. A seamless ventilation duct according to claim 8 wherein the duct is made from thermoplastic or thermoplastic elastomer.

10. A seamless ventilation duct according to claim 8 wherein the duct is made from polypropylene or PVC.

11. A seamless ventilation duct according to any preceding claim formed by extrusion.

12. A method of manufacturing a seamless ventilation duct comprising a plurality of elongate panels and integrally formed hinge means, with each panel being joined to an adjacent panel by said integrally formed hinge means to enable relative movement between the panels, comprising the steps of extruding or moulding the duct, allowing the duct to cool and folding the duct about the hinge means to collapse it for transportation or storage or erect it for installation.

13. A method according to claim 12 wherein the duct is extruded in a collapsed condition.

14. A method according to claim 12 wherein the duct is extruded in a partially erect or erect condition.

15. A method of manufacturing a seamless ventilation duct according to any of claims 12 to 14 wherein the hinge means are extruded from a different material to the rest of the duct.